



Natural Resources Conservation Service
WASHINGTON

WQL24 – Apply enhanced efficiency fertilizer products

CSP Enhancement Washington State Supplement

Land Use Applicability: Cropland, Pastureland

January 2014

Client/Operating Unit:

Tract Number:

Farm/Ranch Location:

Farm Number:

Specifications Date:

Field Number(s):

Planned Installation Date:

Proposed Treatment Acres:

Enhancement Description:

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At least 50% of the pre-emergent and early post emergent nitrogen fertilizer and/or phosphorus fertilizers used for crop production must include enhanced efficiency formulations.

Benefits

Nutrient management encompasses managing the amount, source, placement, and timing of the application of plant nutrients and soil amendments. Nutrient management effectively utilizes available nutrient resources to supply crops with nutrients required to efficiently produce food, forage, fiber, and cover while minimizing environmental degradation.

The use of enhanced efficiency fertilizer products can make nitrogen or phosphorus available to plants over a longer portion of the growing season to match the plant uptake needs. This limits the loss of nitrogen to leaching and denitrification, and can help control soil emissions of the greenhouse gas nitrous oxide. Increased phosphorus availability improves phosphorus use efficiency and reduces the potential for loss by leaching (soluble P) and erosion (P bound to detached soil particles).

Conditions Where Enhancement Applies

This enhancement applies to all crop or pasture land use acres.

Criteria for applying enhanced efficiency fertilizer products

Implementation of this enhancement requires:

1. Enhanced efficiency fertilizers, used in the State must be defined by the Association of American Plant Food Control Officials (AAPFCO) and be accepted for use by the State fertilizer control official, or similar authority, with responsibility for verification of product guarantees, ingredients (by AAPFCO definition) and label claims.
2. The use of one or more nitrogen or phosphorus fertilizer products defined as enhanced efficiency fertilizers that are recommended by the state Land Grant University (LGU) and concurred with by NRCS on all treatment acres to supply at least 50% of the LGU recommended nitrogen or phosphorus requirement for the crop(s) grown.
3. Application of nutrients within the LGU recommendations based on soil testing and established yield goals and considering all nutrient sources.
4. Minimize soil surface disturbance during fertilizer placement.

Layout Sketch & Drawing (Provide sketch, drawings, maps, and/or aerial photographs.)

- Geo-referenced field map with all delineated treatment areas where CSP Enhancement WQL24 is to be applied.

Adoption Requirements

This enhancement is considered adopted when the enhanced efficiency product, for nitrogen or phosphorus enhancement, has been utilized as a fertilizer or fertilizer additive and applied to the land use acre.

Documentation Requirements

1. A map showing where the activities are applied,
2. Enhanced efficiency product used,
3. Treatment acres,
4. Soil test results,
5. Crops grown and yields (both yield goals and measured yield),
6. Calibration of fertilizer application equipment, and
7. Nutrient application rates/amounts and application dates for each treatment area.

Note: In lieu of documenting each individual item listed in the Documentation Requirements, a Certified Crop Advisor plan that contains each of the items may be substituted.

References*:

AAPFCO. 2011. Association of American Plant Food Control Officials, Official Publication No. 64. AAPFCO Inc., Little Rock, Arkansas.

Field Office Technical Guide:

eFOTG. <http://www.nrcs.usda.gov/technical/efotg/>

Ferguson, Richard B., G.W. Hergert, C.A. Shapiro, C.S. Wortmann. Enhanced Efficiency Fertilizers.

<http://cpc.unl.edu/includes/video/SoilFertility/Enhanced%20Efficiency%20Fertilizers.pdf?exampleUserLabel=Your%20Name&exampleSessionId=1229904065000>

Enhanced Efficiency Fertilizers:

<http://cropwatch.unl.edu/web/cropwatch/archive?articleID=4288809>

For Potatoes EFF:

[Hopkins, B. G., Rosen, C. J., Shiffler, A. K., and Taysom, T. W. 2008. Enhanced efficiency fertilizers for improved nutrient management: Potato \(Solanum tuberosum\). Online. Crop Management doi:10.1094/CM-2008-0317-01-RV. http://www.pvmi.org/Storage/General/Enhanced%20Effic%20Fert%20Potato.pdf](http://www.pvmi.org/Storage/General/Enhanced%20Effic%20Fert%20Potato.pdf)

[Olson-Rutz, Kathrin, C. Jones, C.P. Dinkins. 2011. Enhanced Efficiency Fertilizers. Montana State University Extension. EBO188. pp.16. http://msuextension.org/publications/agandnaturalresources/EB0188.pdf](http://msuextension.org/publications/agandnaturalresources/EB0188.pdf)

[Presentation regarding Enhanced Efficiency Fertilizers with many examples. 2008. M. M. Alley. http://www.firt.org/sites/default/files/Alley_University_Overview_Enhanced_Efficiency_presentation.pdf](http://www.firt.org/sites/default/files/Alley_University_Overview_Enhanced_Efficiency_presentation.pdf)

* Some online documents may take several minutes to download.

State Supplemental Information

States need to identify those materials that are considered to meet this criteria.

Important Note: For most enhanced efficiency fertilizer sources, it is unwise to use the slow or controlled release material for 100% of the planned N application rate. This enhancement activity applies to the use of slow or controlled release N sources to supply no less than 30% of the planned N application requirement for the crop.

The timing of the availability of applied N from a fertilizer material when matched to crop nitrogen needs can improve efficiency of uptake. A Nutrient Budget will reflect a planned N use efficiency or a reduction in amount of N losses due to volatilization, denitrification or leaching.

Carbon Based materials with a current sample analysis (examples: Liquid or solid manure or composted materials) utilized as a source of Nitrogen for crops would qualify as slow or controlled release N materials.

(The delayed mineralization rate and availability rate for N is documented for the use of all slow / controlled release materials used in the Nutrient Management Job sheet and specification. Nutrient Management 590, eFOTG Washington State. Section IV.

NRCS eFOTG Washington

ENHANCED EFFICIENCY FERTILIZERS; IPNI; Mike Stewart. Plant Nutrition Today, Spring 2007, No. 6.

<http://www.ipni.net/ipniweb/pnt.nsf/5a4b8be72a35cd46852568d9001a18da/1a380010eb910deb85257289006c66fe!OpenDocument>

Slow or controlled release material is enhanced efficiency: "fertilizer products with characteristics that minimize the potential of nutrient losses to the environment, as compared to 'reference soluble' products."

Commercially available EEN fertilizers generally fall into one of three categories:

- 1) Synthetic organic compounds containing N, (urea-aldehyde condensation products)
- 2) Physical coating or barrier around soluble N fertilizer,
Example (Sulfur coated urea SCU or Polymer coated urea PCU)
- 3) Stabilized materials, such as nitrification and/or urease inhibitors.

Examples: Polymer-coated urea products are designed to match the kinetics of N release with the kinetics of crop uptake. Treatment of urea or UAN with urease and/or nitrification inhibitors to reduce the loss of N through volatilization or leaching where potential for loss is high.

Enhanced efficiency fertilizer materials are best suited for:

- Traditional applications, e.g., turf, ornamentals, nurseries, etc.;
- High value crop production;
- In crops with shallow root systems;
- Where potential for N loss is large, (surface application, sandy soil, high rainfall, etc.)
- Environmentally sensitive circumstances.

When used appropriately, these materials can aid in the accomplishment of our primary objective...to get more of the applied nutrient into the plant. It follows then that they have the potential to reduce loss of nutrients to the environment. Other potential benefits include reduced application frequency, more uniform plant growth, and improved yields. It's important to understand that EE fertilizer materials are tools, not "magic bullets". And, as with any tool, we must understand where it fits and how to use it to best serve its purpose.

Documentation Form

Producer:
 Date:
 Tracts:
 County:

1. A map showing where the activities are applied,
2. Enhanced efficiency product used,
3. Treatment acres,
4. Soil test results,
5. Crops grown and yields (both yield goals and measured yield),
6. Calibration of fertilizer application equipment, and
7. Nutrient application rates/amounts and application dates for each treatment area.

Note: In lieu of documenting each individual item listed in the Documentation Requirements, a Certified Crop Advisor plan that contains each of the items may be substituted.

Field Number(s):					
Target (Planned) Crop:					
Planned Planting Date:					
Yield Goal:					
Treatment Acres:					
Enhanced Efficiency Product Used:					
Calibration of Fertilizer Application Equipment:					
Actual Crop:					
Actual Planting Date:					
Provide the Fertilizer Applied for Each Treatment Area:					
Application Rate/Amount:	N:				
	P ₂ O ₅ :				
	K ₂ O:				
Application Date(s):					
Measured Crop Yield:					
Date Cover Crop Terminated:					

Required Documentation:

- 1. Map Showing where Activities are Applied**
- 2. Soil Test Results**

NOTE: In lieu of documenting each individual item listed above, a Certified Crop Advisor plan that contains each of the items may be substituted.

Client's Acknowledgement (To be signed before the Enhancement is applied.)

By signing below, I acknowledge that I:

- have reviewed and understand the site specific design, installation specifications and operation/maintenance requirements in this State Supplemental Sheet and have an understanding of the purpose(s) of this Enhancement;
- will install, operate, and maintain this Enhancement in accordance with the National Sheet, the Washington State Supplemental Sheet and the site specific specifications.
- will make no changes to the planned design and installation without prior written approval of the Natural Resources Conservation Service.
- will obtain all necessary permits and/or rights, and comply with all ordinances and laws pertaining to the installation, operation, and maintenance of this Enhancement, prior to the start of installation; and
- will assume responsibility for notifying all Utilities affected by the installation, operation and maintenance of this Enhancement.

Signature

Date

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